

## **ATTACHMENT 1**

June 22, 1998, letter from Michael T. Llewelyn, Administrator, Water Quality Division, ODEQ, to Philip Millam, Director, Office of Water, EPA.

June 22, 1998 DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Philip Millam  
Director, Office of Water, OW-134  
U.S. Environmental Protection Agency, Region X  
1200 Sixth Avenue  
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Dear Phil:

This letter is to provide policy clarification of the Oregon water quality standards revisions that were submitted for Environmental Protection Agency's (EPA) approval on July 10, 1996. Specifically, this letter addresses how the Department of Environmental Quality (DEQ) is interpreting certain language contained in the Oregon Water Quality Standards (OAR 340-41) and responds to questions that EPA has raised in its review of the standards.

The regulatory clarifications included herein will be incorporated into the water quality standards, to the extent possible, during the next triennial review. As there are quite a number of issues that are candidates for review in the next triennial review, we will need to carefully prioritize these issues working with EPA and the next Policy Advisory Committee.

The following comments are organized in the following manner: beneficial use issues, numeric criteria issues and implementation issues.

### BENEFICIAL USE ISSUES:

**Bull Trout Waters:** The language in the rule (OAR 340-41- basin (2)(b)(A)) reads: "...no measurable surface water temperature increase resulting from anthropogenic activities is allowed: ... (v) In waters determined by the Department to support or to be necessary to maintain the viability of native Oregon bull trout, when surface water temperatures exceed 50.0° F (12.8° C)". [Please note that the specific citation for the temperature criteria for Bull Trout may vary slightly in its numbering depending on the basin, this example and subsequent citations are from the standards for the Willamette Basin (OAR 340-41-445)].

The Department has consulted with the Oregon Department of Fish and Wildlife (ODFW) to make a determination of the current distribution of Bull Trout. Maps have been developed by ODFW as part of an effort to develop plans to protect and restore Bull Trout populations. These maps can be found in the following publication: "Status of Oregon's Bull Trout" (Oregon Department of Fish and Wildlife; October 1997; Buchanan, David, M. Hanson, and R. Hooton; Portland, OR) which is available from ODFW or viewed in the "StreamNet" website ([www.streamnet.org](http://www.streamnet.org)). A map showing the most recent Bull Trout distribution (export file dated June 1997) has been sent separately to EPA and a digital version can be provided to EPA.



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Furthermore, the Department will apply the antidegradation policy in specific actions, e.g. permits, 401 certification and 303(d) listing, to protect spawning that occurs outside the identified time frames or utilize the narrative temperature criteria that applies to threatened or endangered species.

**Application of the warm-water Dissolved Oxygen Criteria (OAR 340-41- basin (2)(a)(F)):**  
The language in the rule reads: *"For waterbodies identified by the Department as providing warm-water aquatic life, the dissolved oxygen shall not be less than 5.5 mg/l as an absolute minimum..."*

Warm-water criteria is applied in waters where Salmonid Fish Rearing and Salmonid Fish Spawning are not a listed beneficial use in Tables 1 - 19 with the exception of Table 19 (Klamath Basin) in which the cool water dissolved oxygen criteria will be applied (see Klamath TMDL supporting documentation, (Hammon 1998)). Specifically, the warm water criteria would be applied to:

Table 15: Malheur River (Namorf to Mouth), Willow Creek (Brogan to Mouth), Bully Creek (Reservoir to Mouth);

Table 16: Owyhee River (RM 0-18);

Table 17: Malheur Lake Basin - Natural Lakes;

Table 18: Goose and Summer Lakes Basin - High Alkaline & Saline Lakes.

**Application of the cool-water Dissolved Oxygen Criteria (OAR 340-41- basin (2)(a)(E)):**  
The language in the rule reads: *"For waterbodies identified by the Department as providing cool-water aquatic life, the dissolved oxygen shall not be less than 6.5 mg/l as an absolute minimum..."*

Cool-water aquatic life is a sub-category of cold-water aquatic life and is defined under OAR 340-41-006 (52) as *"the aquatic communities that are physiologically restricted to cool waters, composed of one or more species having dissolved oxygen requirements believed similar to the cold-water communities. Including but not limited to Cottidae, Osmeridae, Acipenseridae, and sensitive Centrarchidae such as the small-mouth bass."* This criteria will be applied on an ecoregional basis<sup>1</sup> (see attached map) as follows:

#### **West Side:**

Cold Water: Coast Range Ecoregion - all, Sierra Nevada Ecoregion -all, Cascade-all, Willamette Valley - generally typical including Willamette River above Corvallis, Santiam (including the North and South), Clackamas, McKenzie, Mid Fork and Coast Fork mainstems.

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<sup>1</sup> The original Ecoregions described in "Ecoregions of the Pacific Northwest" (James Omernik and A. Gallant, 1986, EPA/600/3-86/033) were used. This work is currently being updated but is not complete for Oregon. The terms most typical and generally typical are defined as follows: "The most typical portions of ecoregions are generally those areas that share all of the characteristics that are predominant in each ecoregion. The remaining portions, generally typical of each ecoregion, share most, but not all, of these same characteristics. These areas are defined on maps included in the publication referenced above and have been sent separately to EPA.

are included in beneficial use survey work that the Department is undertaking in the Snake River Basin/High Desert Ecoregion. This work, which will include the development of numeric temperature criteria for these waters, will be accomplished during our next triennial standards review (1998-2000).

**Willamette and Columbia River Temperature Criteria:** The language in the rule (OAR 340-41-445 (2)(b)(A)) reads: "...no measurable surface water temperature increase resulting from anthropogenic activities is allowed: ... (ii) In the Columbia River or its associated sloughs and channels from the mouth to river mile 309 when surface water temperatures exceed 68.0°F (20.0°C); (iii) In the Willamette River or its associated sloughs and channels from the mouth to river mile 50 when surface water temperatures exceed 68.0°F (20.0°C);"

For the Columbia River, this is not a change to the previous standard (OAR 340-41-445 (2)(b)(D)). The Columbia River forms the boundary between the states of Oregon and Washington and this criterion is consistent with the current temperature standard for the State of Washington.

For the Willamette River, this value represents a decrease from the previous temperature criteria of 70°F and makes it consistent with the Columbia River numeric criteria. The technical committee had recommended the 68°F criteria for these large, lower river segments recognizing that temperatures were expected to be higher in these segments as factors such as the naturally wide channels would minimize the ability to shade these rivers and reduce the thermal loading.

Both of these rivers are water quality limited for temperature and the temperature criteria can be revisited as part of the effort to develop Total Maximum Daily Loads. The Department is currently working with EPA to develop a temperature assessment for the Columbia River and is participating in a Willamette Basin Reservoir Study with the Corp of Engineers and other state agencies. The timing of specific TMDLs is currently being negotiated with EPA.

**64° F Temperature Criteria:** EPA has expressed concern that the 64°F criterion may not be fully protective. The Final Issue Paper on Temperature indicates that "the incidence of disease from *Chondrococcus columnaris* increases above 60-62° F and cites various sources for this statement (page 2-4 and Appendix D of the Final Issue Paper on Temperature). This is based both on observations from laboratory studies and field studies.

A review of this literature indicates that it is difficult to establish a temperature criteria for waters that experience diurnal temperature changes that would assure no effects due to *C. columnaris*. For example, J. Fryer and K. Pilcher ("Effects of Temperature on Diseases of Salmonid Fishes, EPA-660/3-73-020, 1974) conducted in the laboratory studies using constant temperatures and concluded:

Streams experience a natural fluctuation of daily temperatures so streams that were just meeting the temperature standard would be experiencing temperatures over 60°F for only short periods of time during the day and have lower average temperatures. For example, the Department has summarized temperature data collected at 6 sites around the state which are near the 7-day average of the daily maximum of 64°F (see table below). As shown, the daily average temperatures typically range between 55-60°F. Risks should be minimized at these average temperatures.

In conclusion, the criteria does not represent an assured no-effect level. However, because the criteria represent a "maximum" condition, given diurnal variability, conditions will be better than criteria nearly all of the time at most sites.

	7-Day Statistic	Average Daily Temperatures						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Grande Ronde Basin								
East Fork Grande Ronde River	64.7	57.8	58.1	57.4	57.1	57.3	58.0	58.1
Beaver Creek (upstream La Grande Res.)	65.2	55.1	56.5	58	58.2	59.7	60.1	59.9
Umpqua Basin								
Jim Creek (mouth)	62.5	58.2	59.5	59.9	60.1	58.6	55.7	56.8
Pass Creek (upper)	64.4	59.0	58.7	58.1	58.5	59.1	59.3	57.7
Tillamook Basin								
Myrtle Creek (mouth)	65.0	57.7	59.1	58.6	57.9	58.0	57.6	56.8
Sam Downs Creek (mouth)	63.9	55.8	55.9	55.5	55.5	55.7	55.6	56.1

#### Minimum Dissolved Oxygen Criteria for Cool Water and Warm Water Species:

Warm Water: The Oregon warm water criteria for dissolved oxygen is 5.5 mg/l as a 30 day mean and 4.0 mg/l as a minimum. These values meet or exceed the recommended national criteria for warm water criteria for other life stages (5.5 mg/l as a 30 day mean and 3.0 as a 1 day minimum as shown in Table 1 of the dissolved oxygen criteria in *Quality Criteria for Water, 1986* (EPA 440/5-86-001)). These values are slightly below national criteria suggested for protection of early life stages (6.0 mg/l as a 7 day mean and 5.0 as a 1 day minimum as shown in Table 1 of the dissolved oxygen criteria in *Quality Criteria for Water, 1986*). As shown on Table 2 of the dissolved oxygen criteria in *Quality Criteria for Water, 1986*, this would represent a slight impairment for early life stages.

This criteria would be applied to both native and non-native warm water species. Table 2-3 in the Temperature Issue Paper (page 2-14) contains a list of non-salmonid fish species present in Oregon. Warm water species include: Borax Chub; Cyprinids (goldfish, carp, fathead minnows); Centrarchids (Bluegill, Crappie, Large-mouth Bass); and Catfish. The only known warm-water species that is native to Oregon is the Borax Chub, which is found

In this example, the Department would routinely compare dissolved oxygen values against 8.0 mg/l criteria (the higher dissolved oxygen criteria). Most dissolved oxygen data is collected by a grab sample during the day time and would not reflect minimum conditions, that is why we would use a more restrictive criteria. Adequate information to use the other criteria would involve the collection of diurnal data over long enough periods of time (e.g. multiple days or multiple weeks) during critical time periods (e.g. low flow periods, hottest water temperature periods, period of maximum waste discharge). Such data would be collected through continuous monitoring with proper quality assurance. Based on this data collection, sufficient data would be available to calculate means, minimum means and minimum values and to compare to the appropriate criteria. Models that would provide these statistics could also be compared to the appropriate criteria.

In addition, for actions such as permitting and developing TMDLs, additional information on the beneficial uses of the waterbody will be considered such as: species present; listing status of those species; locations, time periods and presence of sensitive early life stages, etc. Based on presence of early life stages or T&E species, the more conservative criteria would be used.

### **IMPLEMENTATION ISSUES:**

**Air temperature exemption to the water temperature criteria:** OAR 340-41-basin (2)(b) (B) specifies that *"an exceedence of the numeric criteria identified subparagraph (A) ... of this subsection will not be deemed a temperature standard violation if it occurs when the air temperature during the warmest seven-day period of the year exceeds the 90<sup>th</sup> percentile of the seven-day average daily maximum air temperature calculated in a yearly series over the historic record. However, during such periods, the anthropogenic sources must still continue to comply with their surface water temperature management plans developed under OAR 340-41-026(3)(a)(D)."*

This policy identifies criteria to be used in certain limited circumstances to determine whether a violation of the temperature water quality standard has occurred. This interpretation would be applied for the purposes of enforcement of standards and the 303(d) listing determinations. Our interpretation of how this air temperature exemption would be applied has been sent to you separately. In the 1994/96 303(d) list, no water bodies were excluded from the list for this reason.

### **Exceptions to the policy that prohibits new or increased discharged load to receiving streams classified as being water quality limited:**

OAR 340-41-026 (3) (C) states "the new or increased discharged load shall not be granted if the receiving stream is classified as being water quality limited under OAR 340-41-006(30)(a), unless..."

*temperature management plan is being developed and implemented for the water quality limited basin if:*

- (i) in the best professional judgment of the Department, the new or increased discharge load, even with the resulting 1.0°F cumulative increase, will not conflict with or impair the ability of the surface water temperature management plan to achieve the numeric temperature criteria; and*
- (ii) A new or expanding source must demonstrate that it fits within the 1.0°F increase and that its activities will not result in a measurable impact on beneficial uses. This latter showing must be made by demonstrating to the Department that the temperature change due to its activities will be less than or equal to 0.25°F under a conservative approach or by demonstrating the same to the EQC with appropriate modeling.*

*(G) Any source may petition the Department for an exception to paragraph (F) of this subsection, provided:*

- (i) The discharge will result in less than 1.0°F increase at the edge of the mixing zone, and subparagraph (ii) or (iii) of this paragraph applies;*
- (ii) The source provides the necessary scientific information to describe how the designated beneficial uses would not be adversely impacted; or*
- (iii) The source demonstrates that:*
  - (I) It is implementing all reasonable management practices;*
  - (II) Its activity will not significantly affect the beneficial uses; and*
  - (III) The environmental cost of treating the parameter to the level necessary to assure full protection would outweigh the risk to the resource.*

OAR 340-41-026 (3) (F) and (G) reflect an implementation policy for OAR 340-41-026 (3) (C). They clarify under what conditions the Department could allow for an increase in load to a waterbody that is water quality limited for temperature as long as the load did not result in a measurable increase in temperature (less than or equal to 0.25°F) or a cumulative increase of 1.0°F under (F) but a source could petition for up to the cumulative increase of 1.0°F under (G). The cumulative increase typically addresses the situation where there may be multiple new or increased discharges. A TMDL would still be developed to bring the waterbody back into compliance with the temperature criteria. The WLA and the permit for the new or increased source would target the appropriate temperature criteria using a

This will be, for most cases, a variance policy which allows the temperature to increase by a specified amount for a limited period of time in order to allow for an existing point source to discharge to water quality limited waters until a TMDL is prepared. In the case where that source would be the major cause for the temperature criteria to be exceeded and a TMDL would not be developed for that waterbody to bring it back into compliance, a site specific criteria would be developed and submitted to EPA for approval.

**pH Standard exception:** OAR 340-41-basin (2) (d) states *"The following exception applies: Waters impounded by dams existing on January 1, 1996, which have pHs that exceed the criteria shall not be considered in violation of the standard if the Department determines that the exceedence would not occur without the impoundment and that all practicable measures have been taken to bring the pH in the impounded waters into compliance with the criteria."*

This language was intended to address the situation where a hydroproject would be applying for a 401 re-certification and it was found that the action of impounding the waters caused algal growth which caused the reservoir to subsequently exceed the pH standard. This might set up the situation where the only way to re-certify the project would be to destroy the dam which may not be the preferred option. In the cases where this exception would be applied, the Department would develop either a TMDL for nutrients in the upstream watershed, develop a site specific criteria for the waterbody or develop a use attainability analysis to modify the uses for portions of the reservoir.

**Final Note:** ODFW has a great deal of knowledge regarding location and timing for presence, spawning, etc of fish in Oregon streams. Much of this information is either in the files contained in local field offices or is gained from the judgment of the local biologist. Until recently, it has not been mapped. A mapping effort is underway and is furthest along for Bull Trout and Anadromous fish species. There is a coordinated effort underway entitled "StreamNet" ([www.streamnet.org](http://www.streamnet.org)). This work is focused on a species by species mapping which would need to be generalized to match cold, cool, warm-water classification and spawning vs rearing groupings indicated in the standards. Issues such as mapping scales and coverage would still need to be worked out. This effort, to better categorize aquatic life uses, could be addressed in subsequent triennial standards reviews but will need additional funding to complete.

There are quite a number of standards related issues that are candidates for consideration during the next triennial review. DEQ and EPA should get together once DEQ has hired a new standards coordinator to discuss priorities and approaches for conducting the next triennial review process.



Salmonid Spawning

Basin	Salmonids Present within Basin	Spawning - Fry Emergence	Comments
North Coast	CO, CHF, CHS, CS, CT, STW	September 15 - May 31	
Mid Coast	CO, CHF, CHS, CS, CT, STS, STW	September 15 - May 31	
South Coast	CO, CHF, CHS, CT, STW	October 1 - May 31	
Umpqua	CO, CHF, CHS, CT, STS, STW	September 15 - May 31	No spawning occurs in Umpqua R. estuary to Head of Tidewater and Adjacent Marine Waters (OAR 340-41-282, Table 3)
Rogue	BT, CO, CHF, CHS, CT, STS, STW	October 1 - May 31	No spawning occurs in Rogue River estuary and Adjacent Marine Waters (OAR 340-41-362, Table 5).
Willamette - Other Ecoregions	BUT, CHF, CHS, CT, RB, STW	October 1 - May 31	
Willamette - Willamette Valley Ecoregion, most typical	CHF, CHS, CT, RB, STW	October 1 - May 31	No spawning in Willamette R from the mouth to Newberg including Multnomah Channel (OAR 340-41-442, Table 6); spawning may not occur naturally in many of these streams.
Willamette - Clackamas, Santiam (including N & S Fork), McKenzie, Molalla, and Mid Fork Mainstems	BUT, CHF, CHS, CT, RB, STW	September 15 - June 30	
Sandy	CHF, CHS	September 15 - June 30	
Hood - Hood River Drainage	CHF, CHS, CO, STS, STW	September 15 - June 30	
Hood - Miles Creek Drainage	STW, RB	October 1 - June 30	
Deschutes R and East Side Tributaries	BR, BT, BUT, CHF, K, RB, RT, STS	October 1 - June 30	
Deschutes R and West Side Tributaries	BR, BT, BUT, CHF, K, RB, RT, STS	September 1 - June 30	
John Day	BUT, CHS, CT, RT, STS	October 1 - June 30	spawning is typically in upper portions of the basin
Umatilla/Walla Walla	BUT, CHF, CHS, CO, RT, STS	October 1 - June 30	spawning is typically in upper portions of the basin
Grande Ronde	BUT, CHF, CHS, RB, RT, STS	October 1 - June 30	spawning is typically in upper portions of the basin
Powder	BUT, RB, RT	March 1 - June 30	spawning is typically in upper portions of the basin
Malheur River	BUT, RB, RT	March 1 - June 30	No spawning occurs in the Malheur River (Namorf to Mouth), Willow Cr (Brogan to Mouth), Bully Creek (Reservoir to Mouth) and in the following reservoirs: Malheur, Bully Creek, Beulah and Warm Springs (OAR 340-41-802, Table 15); spawning in upper basin
Owyhee	RB, RT, LCT	March 1 - June 30	No spawning occurs in the Owyhee River (RM 0-18) and in the following reservoirs: Antelope, Cow Creek, Owyhee (OAR 340-41-842, Table 16); spawning is typically in upper portions of the basin
Malheur Lake	RB, RT, LCT	March 1 - June 30	No spawning occurs in the natural lakes in the basin (OAR 340-41-882, Table 17); spawning is typically in upper portions of the basin
Goose and Summer Lakes	BT, RT	March 1 - June 30	No spawning occurs in Goose Lake and other highly alkaline and saline lakes (OAR 340-41-922, Table 18); spawning is typically in upper portions of the basin
Klamath	BT, RB, RT	March 1 - June 30	Spawning occurs where natural conditions are suitable for salmonid fish use and no spawning occurs in the Klamath River from Klamath Lake to Keno Dam (RM 255 to 232.5), Lost River (RM 5 to 65) and Lost River Diversion Channel (OAR 340-41-962, Table 19);
Columbia River	CHF, CHS, CHR, CO, CS, CT, SS, STS, STW	October 1 - May 31	No spawning occurs in portions of the Columbia River (OAR 340-41-482 (Table 7), -522 (Table 8), -562 (Table 9))
Snake River	CHF, CHS, SS, STS	October 1 - June 30	

Fish Species Coding:

BT=brook trout; BUT=bull trout; CH=chinook salmon (F=fall, R=summer, S=spring); CO=coho salmon; CS=chum salmon; CT=cutthroat salmon; K=Kokanee; LCT=Lahontan cutthroat trout; RB=rainbow trout; RT=redband trout; SS=sockeye salmon; ST=steelhead (S=summer, W=winter)

Notes:

As a general rule, this table reflects the general time frame for which the numerical spawning criteria listed the temperature and dissolved oxygen standards are generally applicable.  
Spawning times may vary for individual species on particular streams within a basin.  
ODFW biologists will be consulted for final determinations.